SEQUENCE LISTING

<110> Schlievert, Patrick M.
       Roggiani, Manuela
       Stoehr, Jennifer
       Ohlendorf, Douglas

<120> MUTANTS OF STREPTOCOCCAL TOXIN A AND METHODS OF USE

<130> 600.311USWO

<140> US 08/973,391
<141> 1998-03-12

<150> PCT/US96/10252
<151> 1996-06-07

<150> US 08/480,261
<151> 1995-06-07

<160> 14

<170> PatentIn version 3.1

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acgtatatac tcacatcacg caatcggcaa ttgatgacat tggaactaaa ttcaatcaat   180

ttgttactaa caagcaacta gattgacaac taattctcaa caaacgttaa tttaacaaca   240

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ccttgttaca tcaaggtttt ttctttttgt cttgttcatg agttaccata actttctata   360

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tcgctactgt gtcacctaaa atataccccct tatcaatcgc ttctttaaac tcatctatat   600

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ttttgttatt ttataataaa attattaata taagttaatg tttttttaaaa atatacaatt   720

ttattctatt tatagttagc tattttttca ttgttagtaa tattggtgaa ttgtaataac   780

cttttttaaat ctagaggaga acccagatat aaaatggagg aatatta atg gaa aac   836
                                                         Met Glu Asn
                                                          1

aat aaa aaa gta ttg aag aaa atg gta ttt ttt gtt tta gtg aca ttt   884
Asn Lys Lys Val Leu Lys Lys Met Val Phe Phe Val Leu Val Thr Phe
  5   10   15

ctt gga cta aca atc tcg caa gag gta ttt gct caa caa gac ccc gat   932
Leu Gly Leu Thr Ile Ser Gln Glu Val Phe Ala Gln Gln Asp Pro Asp
 20   25   30   35

cca agc caa ctt cac aga tct agt tta gtt aaa aac ctt caa aat ata   980
Pro Ser Gln Leu His Arg Ser Ser Leu Val Lys Asn Leu Gln Asn Ile
             40   45   50

4

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tat ttt ctt tat gag ggt gac cct gtt act cac gag aat gtg aaa tct      1028
Tyr Phe Leu Tyr Glu Gly Asp Pro Val Thr His Glu Asn Val Lys Ser
            55              60              65

gtt gat caa ctt tta tct cac cat tta ata tat aat gtt tca ggg cca      1076
Val Asp Gln Leu Leu Ser His His Leu Ile Tyr Asn Val Ser Gly Pro
        70              75              80

aat tat gat aaa tta aaa act gaa ctt aag aac caa gag atg gca act      1124
Asn Tyr Asp Lys Leu Lys Thr Glu Leu Lys Asn Gln Glu Met Ala Thr
     85              90              95

tta ttt aag gat aaa aac gtt gat att tat ggt gta gaa tat tac cat      1172
Leu Phe Lys Asp Lys Asn Val Asp Ile Tyr Gly Val Glu Tyr Tyr His
100              105             110             115

ctc tgt tat tta tgt gaa aat gca gaa agg agt gca tgt atc tac gga      1220
Leu Cys Tyr Leu Cys Glu Asn Ala Glu Arg Ser Ala Cys Ile Tyr Gly
            120             125             130

ggg gta aca aat cat gaa ggg aat cat tta gaa att cct aaa aag ata      1268
Gly Val Thr Asn His Glu Gly Asn His Leu Glu Ile Pro Lys Lys Ile
            135             140             145

gtc gtt aaa gta tca atc gat ggt atc caa agc cta tca ttt gat att      1316
Val Val Lys Val Ser Ile Asp Gly Ile Gln Ser Leu Ser Phe Asp Ile
        150             155             160

gaa aca aat aaa aaa atg gta act gct caa gaa tta gac tat aaa gtt      1364
Glu Thr Asn Lys Lys Met Val Thr Ala Gln Glu Leu Asp Tyr Lys Val
        165             170             175

aga aaa tat ctt aca gat aat aag caa cta tat act aat gga cct tct      1412
Arg Lys Tyr Leu Thr Asp Asn Lys Gln Leu Tyr Thr Asn Gly Pro Ser
180             185             190             195

aaa tat gaa act gga tat ata aag ttc ata cct aag aat aaa gaa agt      1460
Lys Tyr Glu Thr Gly Tyr Ile Lys Phe Ile Pro Lys Asn Lys Glu Ser
            200             205             210

ttt tgg ttt gat ttt ttc cct gaa cca gaa ttt act caa tct aaa tat      1508
Phe Trp Phe Asp Phe Phe Pro Glu Pro Glu Phe Thr Gln Ser Lys Tyr
            215             220             225

ctt atg ata tat aaa gat aat gaa acg ctt gac tca aac aca agc caa      1556
Leu Met Ile Tyr Lys Asp Asn Glu Thr Leu Asp Ser Asn Thr Ser Gln
            230             235             240

att gaa gtc tac cta aca acc aag taa cttttgctt ttggcaacct             1603
Ile Glu Val Tyr Leu Thr Thr Lys
            245             250

tacctactgc tggatttaga aattttattg caattctttt attaatgtaa aaaccgctca    1663

tttgatgagc ggttttgtct tatctaaagg agctttacct cctaatgctg caaaatttta    1723

aatgttggat ttttgtattt gtctattgta tttgatgggt aatcccattt ttcgacagac    1783

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<213> Streptococcus pyogenes

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Met Glu Asn Asn Lys Lys Val Leu Lys Lys Met Val Phe Phe Val Leu
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Val Thr Phe Leu Gly Leu Thr Ile Ser Gln Glu Val Phe Ala Gln Gln
            20   25   30

Asp Pro Asp Pro Ser Gln Leu His Arg Ser Ser Leu Val Lys Asn Leu
            35   40   45

Gln Asn Ile Tyr Phe Leu Tyr Glu Gly Asp Pro Val Thr His Glu Asn
        50   55   60

Val Lys Ser Val Asp Gln Leu Leu Ser His His Leu Ile Tyr Asn Val
65   70   75   80

Ser Gly Pro Asn Tyr Asp Lys Leu Lys Thr Glu Leu Lys Asn Gln Glu
                85   90   95

Met Ala Thr Leu Phe Lys Asp Lys Asn Val Asp Ile Tyr Gly Val Glu
            100   105   110

Tyr Tyr His Leu Cys Tyr Leu Cys Glu Asn Ala Glu Arg Ser Ala Cys
        115   120   125

Ile Tyr Gly Gly Val Thr Asn His Glu Gly Asn His Leu Glu Ile Pro
    130   135   140

Lys Lys Ile Val Val Lys Val Ser Ile Asp Gly Ile Gln Ser Leu Ser
145   150   155   160

Phe Asp Ile Glu Thr Asn Lys Lys Met Val Thr Ala Gln Glu Leu Asp
                165   170   175

Tyr Lys Val Arg Lys Tyr Leu Thr Asp Asn Lys Gln Leu Tyr Thr Asn
            180   185   190

Gly Pro Ser Lys Tyr Glu Thr Gly Tyr Ile Lys Phe Ile Pro Lys Asn
        195   200   205

6

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Lys Glu Ser Phe Trp Phe Asp Phe Phe Pro Glu Pro Glu Phe Thr Gln
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Ser Lys Tyr Leu Met Ile Tyr Lys Asp Asn Glu Thr Leu Asp Ser Asn
225                 230                 235                 240

Thr Ser Gln Ile Glu Val Tyr Leu Thr Thr Lys
                245                 250


<210>  14
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<213>  Streptococcus pyogenes

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Gln Gln Asp Pro Asp Pro Ser Gln Leu His Arg Ser Ser Leu Val Lys
1               5                   10                  15

Asn Leu Gln Asn Ile Tyr Phe Leu Tyr Glu Gly Asp Pro Val Thr His
            20                  25                  30

Glu Asn Val Lys Ser Val Asp Gln Leu Leu Ser His His Leu Ile Tyr
        35                  40                  45

Asn Val Ser Gly Pro Asn Tyr Asp Lys Leu Lys Thr Glu Leu Lys Asn
    50                  55                  60

Gln Glu Met Ala Thr Leu Phe Lys Asp Lys Asn Val Asp Ile Tyr Gly
65                  70                  75                  80

Val Glu Tyr Tyr His Leu Cys Tyr Leu Cys Glu Asn Ala Glu Arg Ser
                85                  90                  95

Ala Cys Ile Tyr Gly Gly Val Thr Asn His Glu Gly Asn His Leu Glu
            100                 105                 110

Ile Pro Lys Lys Ile Val Val Lys Val Ser Ile Asp Gly Ile Gln Ser
            115                 120                 125

Leu Ser Phe Asp Ile Glu Thr Asn Lys Lys Met Val Thr Ala Gln Glu
    130                 135                 140

Leu Asp Tyr Lys Val Arg Lys Tyr Leu Thr Asp Asn Lys Gln Leu Tyr
145                 150                 155                 160
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7

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Thr Asn Gly Pro Ser Lys Tyr Glu Thr Gly Tyr Ile Lys Phe Ile Pro
            165             170             175

Lys Asn Lys Glu Ser Phe Trp Phe Asp Phe Phe Pro Glu Pro Glu Phe
            180             185             190

Thr Gln Ser Lys Tyr Leu Met Ile Tyr Lys Asp Asn Glu Thr Leu Asp
            195             200             205

Ser Asn Thr Ser Gln Ile Glu Val Tyr Leu Thr Thr Lys
    210             215             220
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